WHAT IS CLAIMED IS:

1. A method of modulating or demodulating a communication signal using differential quadrature phase shift keying (DQPSK), the method comprising:

upon receiving an inbound communication signal, demodulating the inbound communication signal by:

obtaining Pi/4 differential quadrature phase shift keying (DQPSK) symbols;

translating the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols; and

mapping the QPSK symbols to a pair of bits; and

upon initiating an outbound communication signal, modulating the outbound communication signal by:

obtaining communication bits indicative of the outbound communication signal;

translating the communication bits to three communication bits; and

mapping the translated bits to DQPSK symbols.

2. The method of claim 1, wherein the step of translating the communication bits comprises performing an XOR operation.

3. The method of claim 1, wherein the step of translating the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols includes utilizing the formula:

$$S_{QPSK}(t) = (\text{real}(S(t)) + \text{imag}(S(t))) * (\text{real}(S(t-1)) - \text{imag}(S(t-1))),$$

where S(t) is a DQPSK symbol at time t, and $S_{QPSK}(t)$ is a QPSK symbol at time t.

4. The method of claim 3, wherein a phase of a first symbol is not known and a phase of a predecessor symbol is known.

5. The method of claim 1, wherein the step of mapping the QPSK symbols to a pair of bits comprises utilizing a lookup table to map the QPSK symbols to a pair of bits.

6. The method of claim 5, wherein the lookup table includes the following values stored therein:

X	Y	Theta
0	0	Pi / 4
0	1	3 Pi / 4
1	0	- 3 Pi / 4
1	1	- Pi / 4

7. The method of claim 1, wherein the step of translating the communication bits to three communication bits includes providing two variable bits and a hardwired one bit to an adder.

8. The method of claim 1, wherein the step of mapping the translated bits to DQPSK symbols includes an 8 phase shift keying (PSK) modulation using a lookup table.

9. The method of claim 1, wherein modulating does not require a complex multiplication operation.

10. A Pi/4 differential quadrature phase shift keying (DQPSK) modem, the modem comprising:

a processing unit; and

a storage device coupled to the processing unit and having stored there information for configuring the processing unit to:

obtain Pi/4 differential quadrature phase shift keying (DQPSK) symbols;

translate the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols;

map the QPSK symbols to a pair of bits;

obtain communication bits indicative of the outbound communication signal;

translate the communication bits to three communication bits; and

map the translated bits to DQPSK symbols.

11. The modem of claim 10, wherein the translation of the communication bits to three communication bits includes performing an XOR operation.

12. The modem of claim 10, wherein the mapping of QPSK symbols to a pair of bits performed by the processing unit includes utilizing a lookup table to map the QPSK symbols to a pair of bits.

13. The modem of claim 10, wherein the processing unit translates the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols for demodulation by using the formula:

$$S_{QPSK}(t) = (\text{real}(S(t)) + \text{imag}(S(t))) * (\text{real}(S(t-1)) - \text{imag}(S(t-1))),$$

where S(t) is a DQPSK symbol at time t, and $S_{QPSK}(t)$ is a QPSK symbol at time t.

14. The modem of claim 10, wherein the storage device includes a look up table having the following values stored therein:

QPSK Symbol Input	Two Bits Output
Pi / 4	00
3 Pi / 4	01
- 3 Pi / 4	10
- Pi / 4	11

15. A system which modulates or demodulates a communication signal using differential quadrature phase shift keying (DQPSK), the system comprising:

means for obtaining Pi/4 differential quadrature phase shift keying (DQPSK) symbols;

means for translating the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols;

means for mapping the QPSK symbols to a pair of bits;

means for obtaining communication bits indicative of the outbound communication signal;

means for translating the communication bits to three communication bits; and

means for mapping the translated bits to DQPSK symbols.

16. The system of claim 15, wherein the means for translating the communication bits to three communication bits does not involve a complex multiplication operation.

17. The system of claim 15, wherein the means for translating the communication bits to three communication bits includes means for performing an XOR operation.

18. The system of claim 15, wherein the means for translating the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols includes utilizing the formula:

$$S_{QPSK}(t) = (\text{real}(S(t)) + \text{imag}(S(t))) * (\text{real}(S(t-1)) - \text{imag}(S(t-1))),$$

where S(t) is a DQPSK symbol at time t, and $S_{QPSK}(t)$ is a QPSK symbol at time t.

19. The system of claim 18, wherein a phase of a first symbol is not known and a phase of a predecessor symbol is known.

20. The system of claim 15, wherein the means for mapping the QPSK symbols to a pair of bits comprises means for utilizing a lookup table to map the QPSK symbols to a pair of bits.

21. A method of modulation using differential quadrature phase shift keying (DQPSK), the method comprising:

obtaining two communication bits indicative of the outbound communication signal;

translating the two communication bits to three communication bits; and

mapping the translated bits to DQPSK symbols.

22. A method of demodulation using differential quadrature phase shift keying (DQPSK), the method comprising:

obtaining Pi/4 differential quadrature phase shift keying (DQPSK) symbols;

translating the Pi/4 DQPSK symbols into quadrature phase shift keying (QPSK) symbols; and

mapping the QPSK symbols to a pair of bits.